

A review of the Australian species of *Minuthodes* Andrewes, with the description of two new species

(Coleoptera, Carabidae, Lebiinae)*

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Baehr, M. (1989): A review of the Australian species of *Minuthodes* Andrewes, with the description of two new species (Coleoptera, Carabidae, Lebiinae). – Spixiana 13/1: 33–41

The Australian species of the Lebiine genus *Minuthodes* are reviewed. *M. demarzi*, spec. nov. and *M. serrata*, spec. nov. from far Northern Territory and Western Australia, respectively, are described, and the genitalia of the known Australian species are figured. Apart from *M. queenslandica* (Sloane) which is closely related to the New Guinean species *M. papuana* (Sloane), all other Australian species are taxonomically isolated and they constitute two species groups, both having undergone an ecological shift from rain forest to woodland or even semidesert where they live under the bark of eucalypts.

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Introduction

The Australian species of *Minuthodes* Andrewes have been rather controversially classified in the past. Whereas Moore (1987) lists under *Minuthodes* only *Platia queenslandica* Sloane (preoccupied *Platia* Chaudoir later replaced by *Minuthodes* Andrewes), Csiki (1932) included also *Sarothrocrepis minima* Macleay. Sloane (1917), in a notice, included also *Philophloeus froggatti* Macleay, earlier placed by him in *Agonocheila* (Sloane 1898). This decision, however, escaped apparently from the notice of both, Csiki (1932) and Moore (1987). After comparison of the three species mentioned with about 25 species of *Agonocheila*, I am sure that they are more closely related one to another, than to any *Agonocheila* species. If any Australian species belongs to *Minuthodes* at all, then all three species should be included.

It should be noted, however, that the generic limits of *Minuthodes* and *Agonocheila* are rather weak. In Darlington's (1968) key to the genera of New Guinean Lebiini, for example, the single differentiating character is the relative width of head and prothorax. It is doubtful, therefore, whether *Minuthodes* is at all justified as separate genus. At present, I treat it as distinct genus and I include the three Australian species *Sarothrocrepis minima* Macleay, 1864, *Philophloeus froggatti* Macleay, 1888, and *Platia queenslandica* Sloane, 1917, as well as two new species described below.

* Supported by a travel grant of the DFG.

Measurements

Measurements have been made under a stereo microscope using an ocular micrometer. Length has been measured from apex of labrum to apex of elytra, measurements may therefore slightly differ from those of other authors, especially of Darlington (1968). Length of pronotum was measured from anterior angles to most projecting part of base.

Characters

Main differentiating characters are body shape, especially outline of pronotum and elytra, pattern, degree of microsculpture and puncturation, and shape of ♂ genitalia, as far as these are recorded.

Minuthodes Andrewes

Minuthodes Andrewes, 1941: 317; Darlington 1968: 95; Moore 1987: 293.

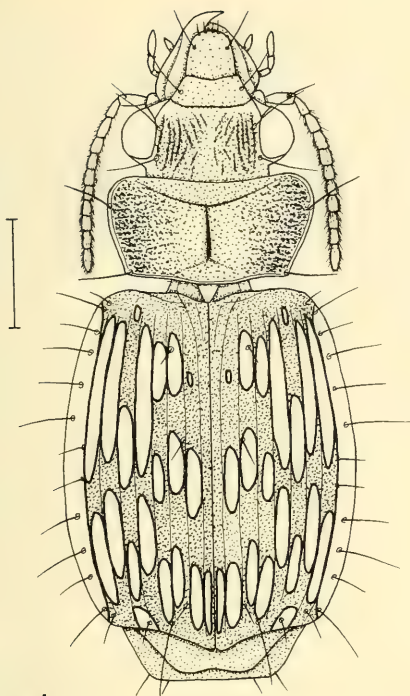
Platia Chaudoir, 1869: 155; Sloane 1917: 432; Csiki 1932: 1361.

Type species: *Platia lineella* Chaudoir, 1869.

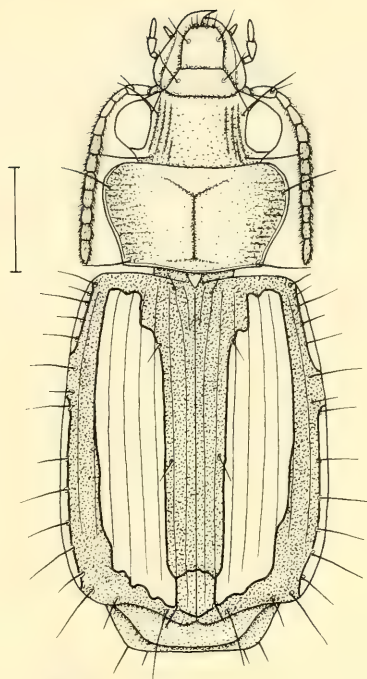
Diagnosis. 4th segment of metatarsus not deeply emarginate; claws serrate; mentum toothed; dorsal surface of body pubescent (in Australian species); pronotum always with one anterior lateral seta only; terminal segment of labial palpus longer than penultimate; head very wide, though narrower than pronotum; pronotum at least 1.5× as wide as long, mostly wider; elytra depressed, short and wide, apex sinuate; in all Australian species also some longitudinal furrows present near eye.

Key to the Australian species of genus *Minuthodes* Andrewes

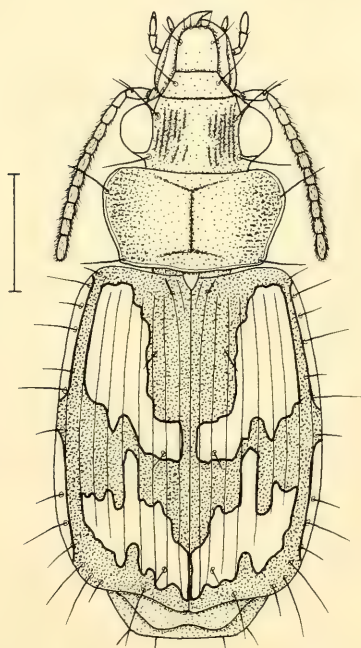
1. Larger species, c. 5 mm long 2.
– Smaller species, less than 3.5 mm long 4.
2. Elytra posteriorly remarkably widened, with pattern of numerous longitudinal yellow lines, though no line wider than one interval. Pronotum c. 2 × wider than long, or even wider. North-eastern Queensland *M. queenslandica* (Sloane)
– Elytra posteriorly not much widened, pattern different, not consisting of yellow lines only as wide as one interval. Pronotum narrower, less than 1.85 × wider than long. Northern Territory and Western Australia 3.
3. Elytral pattern consisting of an elongate, entire, wide, reddish fascia on each elytron. Puncturation of middle of frons and pronotum superficial, microreticulation almost wanting, surface glossy. Far Northern Territory and north-western Australia *M. froggati* (Macleay)
– Elytral pattern consisting of a large anterior, lyra-shaped common spot and a serrate, semilunar, common posterior spot. Puncturation of middle of frons and pronotum strong, microreticulation distinct, surface rather dull. Far Northern Territory *M. demarzi*, spec. nov.
4. Elytral pattern consisting of a large anterior, yellow spot on each elytron and of a common, narrow, v-shaped, posterior macula, laterally not surpassing 5th interval. Posterior part of frons, and vertex as strongly microreticulate as anterior part of head. Pronotum less wide on the average, apex more concave, lateral parts of base more oblique, posterior angles obtuse. Eastern Australia . . . *M. minima* (Macleay)
– Elytral pattern consisting of a large anterior spot, more or less interrupted at 5th interval, and of a very serrate posterior spot, more or less touching anterior spot on 5th interval, and mostly surpassing laterally 6th interval. Posterior part of frons, and vertex with superficial microreticulation, vertex almost smooth. Pronotum wider on the average, apex less concave, lateral parts of base less oblique, posterior angles acute. Far north-western Northern Territory, north-western Australia *M. serrata*, spec. nov.



1



2



3

Fig. 1. *Minuthodes queenslandica* (Sloane). Scale: 1 mm.

Fig. 2. *Minuthodes froggatti* (Macleay). Scale: 1 mm.

Fig. 3. *Minuthodes demarzi*, spec. nov. Holotype. Scale: 1 mm.

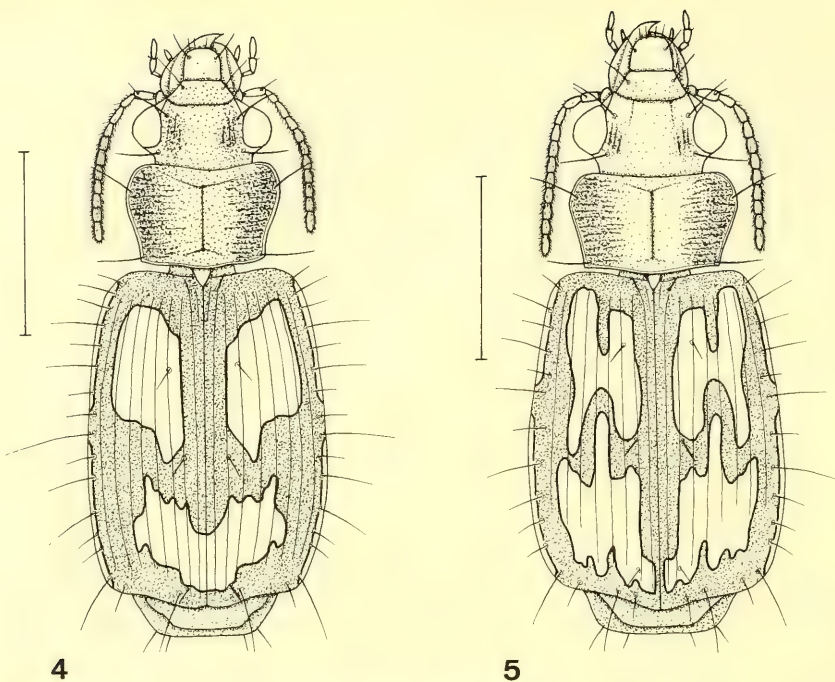


Fig. 4. *Minuthodes minima* (Macleay). Scale: 1 mm.

Fig. 5. *Minuthodes serrata*, spec. nov. Holotype. Scale: 1 mm.

***Minuthodes queenslandica* (Sloane)**

(Figs 1, 9, 14)

Platia queenslandica Sloane, 1917: 432; Csiki 1932: 1361.

Minuthodes queenslandica Darlington 1968: 97; Moore 1987: 293.

This remarkable and easily identified species is known from several localities in north-eastern Queensland (Moore 1987). It is distinguished from all other Australian species and is perhaps most closely related to New Guinean *M. papuana* (Sloane).

Records: I saw specimens from Bloomfield Forest, south of Cooktown, collected under bark of fallen logs in upland rain forest.

***Minuthodes froggatti* (Macleay), new combination**

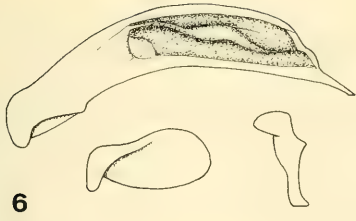
(Figs 2, 6, 10, 14)

Philophloeus froggatti Macleay, 1888: 455.

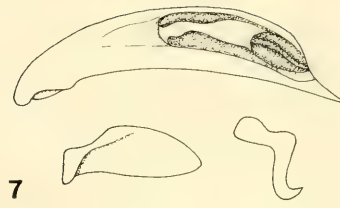
Agonocheila froggatti Sloane 1898: 499; Csiki 1932: 1380; Moore 1987: 290.

Platia froggatti Sloane 1917: 432.

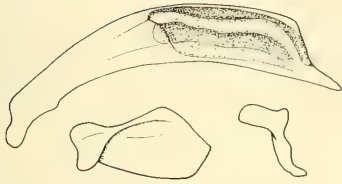
Elytral pattern of this species is unusually simple for the genus, and indeed, the rather parallel elytra remember species of *Agonocheila*. The shape of head and the wide prothorax, however, are rather similar to *M. queenslandica*. This species was so far known from "King Sound" (Macleay 1888), "Upper Ord River" (Sloane 1898), and Darwin (Sloane 1917). The last record, however, was not included in the catalogue of Moore (1987).



6



7



8

Fig. 6. ♂ genitalia of *M. froggatti* (Macleay).

Fig. 7. ♂ genitalia of *M. minima* (Macleay).

Fig. 8. ♂ genitalia of *M. serrata*, spec. nov.

Records: Northern Territory: 30 km S. of Pine Creek, 6.XI.1984; 17 km NE. of Willeroo, 8.XI.1984; 11 km W. of Timber Creek, Victoria River, 11.XI.1984. Western Australia: 135 km N. of Halls Creek, 14.XI.1984; Ord River, 105 km N. of Halls Creek, 15.XI.1984; Windjana Gorge, 150 km E. of Derby, 23.XI.1984; altogether 16 specimens, all collected by myself, mostly under bark of River Eucalypt (*Eucalyptus camaldulensis*), but single specimens also at light.

This species is rather widely distributed from about Darwin in Northern Territory through most of north-western Northern Territory to north-western Australia including the whole of the Kimberley Division.

Minuthodes demarzi, spec. nov.

(Figs 3, 11, 14)

Holotype: ♀, North. T., Humpty Doo, XII.57, leg. H. Demarz (FMT). The specimen bears a label: *Platia* sp. probably new. Det. B. P. Moore '66.

Diagnosis. Large species, recognized by complex elytral pattern, consisting of two common, lyra-shaped or semilunar yellow spots, and by strongly punctate and microreticulate head and pronotum.



9



10



11



12



13

Figs 9–13. ♀ genitalia, stylus. 9. *M. queenslandica* (Sloane); 10. *M. froggatti* (Macleay); 11. *M. demarzi*, spec. nov.; 12. *M. minima* (Macleay); 13. *M. serrata*, spec. nov.

Description

Length: 5.1 mm; ratio width/length of pronotum: 1.85; ratio width of head/of pronotum: 1.18; ratio length/width of elytra: 1.29.

Colour. Head and pronotum deep black, elytra piceous black, with dark yellow pattern. Elytral pattern consisting of a large lyra-shaped anterior spot, laterally extending from 8th interval to middle, but leaving the suture dark, and of a quite serrate, semilunar posterior spot with an anteriorly projecting arm at 5th interval, where the posterior spot almost touches the anterior macula. Lateral channel narrowly pale behind shoulders and in posterior half, interrupted by a narrow, transverse stripe. Apex black. Lower surface dark brown. Antenna and palpi reddish, mandibles and anterior border of labrum brown. Femora piceous, their apices, tibiae, and tarsi reddish.

Head. Wide. Frons depressed. Eyes large, protruding, though head distinctly narrower than pronotum. Clypeo-frontal suture deep. Clypeus basally convex, transversely impressed in anterior half. Anterior border concave in middle. Labrum elongate, slightly longer than wide. Apex convex, laterally very oblique, six-setose, though lateral seta far removed from apex. Terminal segment of labial palpus longer than penultimate segment. Mentum with unidentate tooth. Antennae rather short, densely pilose from 5th segment, anterior segments more sparsely setose. Median segments not much longer than wide. Labrum and clypeus sparsely, frons strongly punctate, whole surface strongly microreticulate. Frons near eyes with four to five very strong longitudinal furrows. Medially with rugose puncturation, forming also some irregular furrows. Whole surface isodiametrically microreticulate.

Pronotum. Very wide, rather heart-shaped. Apex wider than base, gently concave, anterior angles rounded off. Sides widest in anterior third, at anterior lateral seta. At this position sides with a very obtuse angle, then convexly narrowed to base, though with a slight sinuosity in front of posterior angles which are slightly obtuse. Base gently convex, lateral parts rather horizontal. Apex and base bordered, lateral channel moderately wide throughout. Surface in middle strongly raised. Median line distinct, posteriorly rather impressed. Basal grooves deep, prebasal transverse sulcus distinct. Puncturation of surface laterally and basally very coarse, rugose, in middle less rugose, though distinct. Microreticulation on whole surface distinct. Pronotum covered with short, rather sparse pubescence.

Elytra. Wide and short, slightly widened in posterior third, depressed. Shoulders strongly rounded off, sides evenly convex, apex sinuate. Striae well impressed, punctate, intervals perceptibly convex. Whole surface strongly punctate and microreticulate, covered with rather hirsute, yellow pubescence. Punctures of third interval barely recognizable. Winged.

Lower surface. Rather sparsely pilose. Metepisternum elongate, about twice as long as wide at apex. ♀ with two pairs of setae on terminal abdominal segment.

♂ genitalia. Unknown.

♀ genitalia. Styli see fig. 11.

Distribution. Northernmost Northern Territory, known only from type locality.

Habits. Not recorded, though most probably under bark of trees.

Relationships

Related to Australian *M. froggatti* (Macleay), but perhaps also to *M. regularis* Darlington and/or *M. irregularis* Darlington, both from New Guinea.

***Minuthodes minima* (Macleay), new combination**

(Figs 4, 7, 12, 15)

Sarothrocrepis minima Macleay, 1864: 111.

Platia minima Sloane 1917: 433; Csiki 1932: 1361.

Agonocheila minima Moore 1987: 290.

Agonocheila littera-v Chaudoir, 1869: 227.

Small species, widely distributed in eastern Australia from Queensland to eastern South Australia (Moore 1987). It is next related to a new species from northern and north-western Australia, described below.

Records: I collected some specimens in central and eastern Queensland under bark of eucalypts and at light.

***Minuthodes serrata*, spec. nov.**

(Figs 5, 8, 13, 15)

Types. Holotype: ♂, Western Australia, Windjana Gorge, 150 km E. of Derby, 23. XI. 1984, M. Baehr (ANIC).
– Paratypes: 3 ♂♂, 2 ♀♀, same data (ANIC, CBM, ZSM); 1 ♂, Western Australia, 2 km NW. of Windjana Gorge, 22. XI. 1984, M. Baehr (CBM); 1 ♂, 3 ♀♀, Western Australia, Mary River, 115 km WSW. of Halls Creek, 17. XI. 1984, M. Baehr (CBM, WAM); 1 ♀, Western Australia, Fitzroy Crossing, 18.–20. XI. 1984, M. Baehr (CBM); 1 ♀, Northern Territory, Victoria River, 11 km W. of Timber Creek, 11. XI. 1984, M. Baehr (CBM).

Diagnosis. Small species, recognized by complex, serrate elytral pattern, rather smooth frons and vertex, wide pronotum with lateral parts of base horizontal and posterior angles acute.

Description

Length: 2.9–3.4 mm; ratio width/length of pronotum: 1.51–1.72; ratio width of pronotum/width of head: 1.06–1.14; ratio length/width of elytra: 1.28–1.31.

Colour. Black, elytra with yellow to light reddish pattern, consisting of an anterior spot, more or less interrupted anteriorly and posteriorly at 5th interval, and extending from 3rd to 7th interval, and an extremely serrate posterior macula, extending from 2nd to 7th interval which sends an elongate branch on 5th interval into the posterior excision of the anterior spot. In some specimens, both spots are even united in that area. Mandibles and labrum anteriorly and laterally reddish. Palpi and antennae light reddish. Femora piceous, tibiae and tarsi reddish. Lower surface dark piceous to black.

Head. Rather wide, though narrower than pronotum. Eyes large, protruding, orbits very small. Frons depressed. Clypeo-frontal suture rather deep, clypeus barely convex, anteriorly transversely depressed, anterior border straight. Labrum slightly wider than long, anterior border straight, laterally oblique, six-setose, lateral seta far removed from apex. Terminal segment of labial palpus longer than penultimate segment. Palpi sparsely pilose. Labium with unidentate tooth. Antenna short, slightly surpassing base of pronotum, median segments as wide as long. Four basal segments sparsely setose, from 5th segment densely pilose. Labrum, clypeus, and middle of frons almost impunctate, lateral part of frons with coarse and dense puncturation. Occiput more sparsely punctate. Punctures near median borders of eyes confluent into some inconspicuous and rather irregular longitudinal furrows. Labrum, clypeus, and anterior part of head with conspicuous, isodiametric microreticulation, occiput almost devoid of microsculpture, fairly glossy.

Pronotum. More or less wide, heart-shaped, apex wider than base. Apex gently concave, anterior angles slightly produced, though completely rounded off. Pronotum widest at anterior lateral setae, slightly in front of anterior third. Sides anteriorly strongly convex, sinuate in front of posterior angles which are rectangular or even slightly projecting. Base almost straight, median lobe feebly convex, lateral parts not or but feebly oblique. Apex and base narrowly bordered, lateral channel narrow. Median line deeply impressed, especially near base, attaining apex and base. Median part convex, whole surface punctate, though puncturation much denser and fairly rugose laterally and basally, than in middle. Microreticulation present, isodiametric, though in middle superficial. Surface with sparse, depressed, yellow pilosity.

Elytra. Depressed, wide and short, slightly widened to posterior third. Shoulders rounded, lateral border rather straight, but slightly concave in anterior third, apex obliquely sinuate. Striae shallow, wide, intervals depressed, not well perceptible. Whole surface strongly punctate and microreticulate,

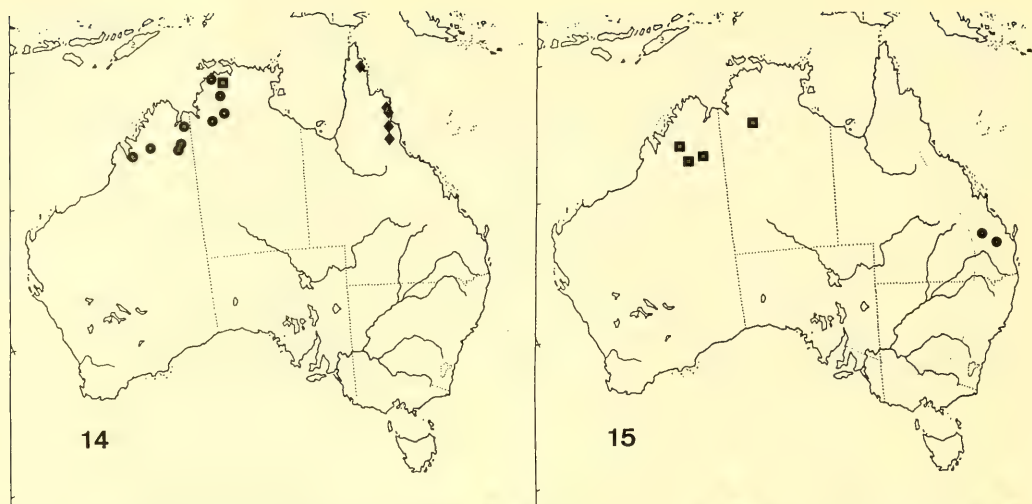


Fig. 14. Distribution of *M. queenslandica* (Sloane): ◆, *M. froggatti* (Macleay): ●, and *M. demarzi*, spec. nov.: ■.
 Fig. 15. Distribution of *M. minima* (Macleay): ● and *M. serrata*, spec. nov.: ■. Dotted line: Approximate range of *M. minima* (Macleay).

giving the surface a slightly granulate appearance. Pilosity yellow, short, sparse, though regular, rather depressed. Three punctures on 3rd interval recognizable. Winged.

Lower surface. Sparsely punctate and pilose. Metepisternum elongate, about twice as long as wide at apex. Both sexes with two pairs of setae at terminal abdominal segment.

Legs. ♂ anterior tarsus with 1st–4th segments slightly dilatated and clothed underneath.

♂ genitalia. Aedeagus with acute, elongate apex. Parameres see fig. 8.

♀ genitalia. Stylus see fig. 13.

Variation. Some variation noted in size and pattern. Some specimens with extraordinarily narrow pronotum, though ♂ genitalia similar.

Distribution. Known from Kimberley Division in north-western Australia and adjacent north-western part of Northern Territory.

Habits. Collected at light and from under bark of River Eucalypt.

Relationships

M. serrata is certainly next related to *M. minima* of eastern Australia. Together, both species are the smallest members of this genus.

Tab. 1. Comparison of length and some size ratios of the Australian *Minuthodes*. N: Number of specimens measured. ★: most specimens between 1.68–1.72. ★★: most specimens between 1.12–1.14.

| | <i>M. queenslandica</i> | <i>M. froggatti</i> | <i>M. dermarzi</i> | <i>M. minima</i> | <i>M. serrata</i> |
|--------------------|-------------------------|---------------------|--------------------|------------------|-------------------|
| N | 2 | 6 | 1 | 3 | 6 |
| length | 4.8–5.2 mm | 5–5.55 mm | 5.1 mm | 3.2–3.4 mm | 2.9–3.4 mm |
| ratio width | | | | | |
| length of pronotum | 2.0–2.03 | 1.68–1.80 | 1.85 | 1.54–1.57 | 1.51–1.72★ |
| ratio width | | | | | |
| of pronotum/head | 1.17–1.21 | 1.09–1.15 | 1.18 | 1.12–1.16 | 1.06–1.14★★ |
| ratio length/ | | | | | |
| width of elytra | 1.20–1.23 | 1.29–1.31 | 1.29 | 1.35–1.40 | 1.28–1.31 |

Discussion

The genus *Minuthodes* has a limited range from the Moluccas and Sulawesi to New Britain and northern and eastern Australia. It has the centre of diversity apparently in New Guinea, from where nine species are known (Darlington 1968). This is perhaps a rather unusual distribution pattern which demonstrates the existence of an own Melanesian zoogeographical subregion.

Of the five Australian species, only *M. queenslandica* is apparently closely related to a non-Australian species (Darlington 1968), whereas *M. froggatti* and *M. demarzi*, and yet more *M. minuta* and *M. serrata* form rather isolated Australian groups.

The ecology of these species matches well the distribution pattern. Whereas all non-Australian species and *M. queenslandica* apparently are rain forest dwellers (Darlington 1968), the four Australian species live mainly or completely under the bark of eucalypts in more or less open woodland or even in isolated stands of River Eucalypts surrounded by desert or semidesert. This is certainly a highly derived ecological shift which points to a fairly long, independent history of these species in Australia.

Acknowledgements

Thanks are due to the authorities of the Deutsche Forschungsgemeinschaft (DFG) for supporting of this paper by a travel grant.

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